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**Full Record****Record 1 of 1****Title:** ROLE OF CALCIUM-PHOSPHOLIPID-PHOSPHATE COMPLEXES IN  
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**Metabolic Bone Disease and Related Research**  
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## The rote of calcium-phospholipid-phosphate complexes in tissue mineralization

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## Abstract

Calcium-phospholipid-phosphate complexes have been associated with the initiation of tissue mineralization. These complexes, which originally were probably membrane components have been characterized in rabbit and bovine tissues. The properties of these complexes, the factors controlling their formation, and their role in initiating calcification are discussed.

## Résumé

Des complexes calcium-phospholipide-phosphate sont impliqués dans l'initiation de la minéralisation tissulaire. Ces complexes, qui, à l'origine étaient probablement des composants membranaires, ont été caractérisés dans les tissus bovins et de lapin. Les propriétés de ces complexes, les facteurs contrôlant leur formation et leur rôle dans l'initiation de la calcification sont discutés.

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Boskey, A. L.



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A discussion is given of the role of Ca-phospholipid-phosphate complexes in tissue mineralization, especially in the initiation of the process, as seen from expts. with rabbit and bovine tissues. The mechanism of hydroxylapatite formation by complexed lipids, a postulated in vivo calcification mechanism, and the properties of the complexes are discussed.

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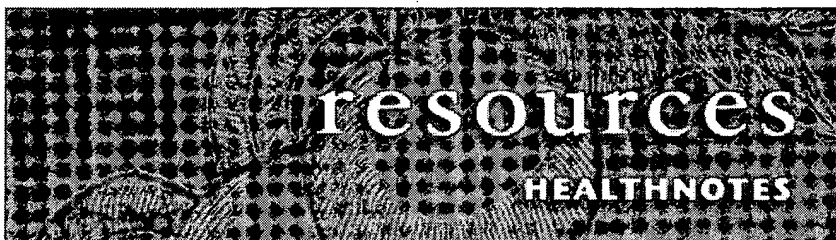
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## Cartilage and Collagen

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### What is it?

Cartilage, derived from shark, bovine (cow), and other animal sources, is a type of connective tissue composed of mucopolysaccharides (including **chondroitin sulfate**), protein substances, **calcium**, **sulfur**, and **collagen**. **Collagen** is one of the proteins found in most connective tissues, including cartilage, bone, and skin. **Gelatin** is a form of **collagen** commonly used in foods, and preliminary reports suggest that consuming **gelatin** can improve the structure and health of the hair and nails.<sup>1 2 3 4</sup> **Collagen** hydrolysate is produced by enzymatically breaking down bovine **gelatin** to smaller protein fragments.

### Where is it found?

Cartilage is derived from either sharks or cows. **Collagen** is derived from either cows or chickens.

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**Cartilage and collagen have been used in connection with the following conditions** (refer to the individual health concern for complete information):

Rating	Health Concerns
☆☆☆	<b>Osteoarthritis</b>
☆☆☆	Karposi's sarcoma (skin cancer) <b>Prostate cancer</b> (shark cartilage)
☆☆☆ Reliable and relatively consistent scientific data showing a substantial health benefit. ☆☆☆ Contradictory, insufficient, or preliminary studies suggesting a health benefit or minimal health benefit. ☆☆☆ For an herb, supported by traditional use but minimal or no scientific evidence. For a supplement, little scientific support and/or minimal health benefit.	

### ***Who is likely to be deficient?***

Since they are not essential nutrients, neither cartilage nor **collagen** are associated with deficiencies.

### ***How much is usually taken?***

Bovine cartilage is typically recommended at 3 grams three times per day. Shark cartilage is sometimes taken in much higher amounts (e.g., 60 to 100 grams per day orally or by enema). These amounts are based on animal and anecdotal evidence and their safety and efficacy have not been confirmed by controlled clinical trials. Not only is toxicity information on this amount of shark cartilage lacking, but the amount of calcium in this amount of shark cartilage exceeds the 2 to 2.5 grams per day that is commonly considered to be the upper limit of safe intake. Type II **collagen**, when used for its effects on the immune system in rheumatoid arthritis, is used in very small amounts, from 0.02 mg to 10 mg per day. **Gelatin** and **collagen** hydrolysate is recommended at 7 to 10 grams per day.

### ***Are there any side effects or interactions?***

Reports have suggested that some people should not use a cartilage supplement. This concern is based only on theory, not clinical evidence. This would include those people with **cardiovascular disease**, women who are planning to be or are **pregnant**, nursing mothers, anyone having or having had surgery within 30 days, and **athletes** training intensely. None of these concerns have been proven in clinical trials, however. Because shark cartilage contains **calcium**, people who ingest large amounts of shark cartilage (60 to 100 grams per day) may be consuming excessive amounts of this mineral. However, no cases of calcium toxicity resulting from the ingestion of shark cartilage have been reported.

While use of **gelatin**, **collagen** hydrolysate, or type II **collagen**

has not resulted in any reports of serious side effects, people with known sensitivities to chicken or beef should consult a doctor before using them.

At the time of writing, there were no well-known drug interactions with cartilage.

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